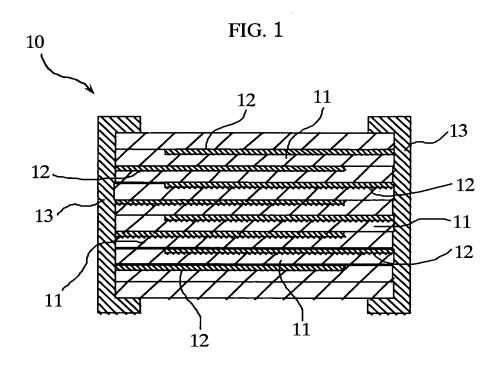
Inventor: KOGA ET AL.
Docket No.: 10921.380USWO
Title: DIELECTRIC PORCELAIN COMPOSITION, MULTILAYER CERAMIC
CAPACITOR, AND ELECTRONIC COMPONENT
Attorney Name: Douglas P. Mueller
Phone No.: 612.455.3804
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CAPACITOR, AND ELECTRONIC COMPONENT
Attorney Name: Douglas P. Mueller
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							-	heet 2												•	
B_2O_3	ı			1	1	1	1	1	ı	1		ı	i	ı		-	ı	ı		1	1
$A_{1_2O_3}$	0.500	0. 500	0. 500	0. 500	0.500	0. 500	0. 500	0. 500	0. 500	0. 500	0. 500	0. 500	0.500	0. 500	0.500	0.500	0.500	0.500	0.500	0. 500	0. 500
V_2O_5	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Ge_2O_3	ı	I	ŀ	1	ı	1	I	ı	ı	ı	ŀ	I	I	1	ı	I	1	ı	2.000	2.000	-
$S i O_2$	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	0. 500	1.000	2. 500	6.000	2.000	1	ı	2.000
SrO	ı	ı	1	1	_	ı	ı	1	-	1	1	1	ı	ı	ı	1.	ı	ı	2.000	ı	1,000
CaO	1	I	ı	ı	1	ŀ	-	ı	-	ı	I	ı	ı	ı	ı	. 1	1	2,000	ı	1.000	-
BaO	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	0.500	1.000	2.500	6.000	ı	ı	1.000	1.000
Ho_2O_3	-	ı	ı	ı	-	ı	ı	1	ı	ı	0.125	0. 500	0.625	_	ı	1	1	1	ı	ı	1
Y_2O_3	0.625	0.625	0.625	0.625	0.625	0.625	0.625	0.250	0.625	1.500	0. 500	0.125	_	0.625	0.625	0.625	0.625	0.625	0.625	0.625	0.625
$MnO+Cr_2O_3$	1.100	1.600	2.600	4.500	1.025	1.000	2.000	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600
Cr_2O_3	0. 600	0. 600	0. 600	0.600	0.050	0.450	1.000	0. 600	0.600	0.600	0.600	0. 600	0.600	0. 600	0. 600	0.600	0. 600	0. 600	0. 600	0. 600	0. 600
MnO	0. 500	1.000	2.000	3.900	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	Ex. 1	Ex. 2	Ex. 3	Ex. 4	Ex. 5	Ex. 6	Ex. 7	Ex. 8	Ex. 9	Ex. 10	Ex. 11	Ex. 12	Ex. 13	Ex. 14	Ex. 15	Ex. 16	Ex. 17	Ex. 18	Ex. 19	Ex. 20	Ex. 21

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Inventor: KOGA ET AL. Docket No.: 10921.380USWO

Title: DIELECTRIC PORCELAIN COMPOSITION, MULTILAYER CERAMIC

CAPACITOR, AND ELECTRONIC COMPONENT

Attorney Name: Douglas P. Mueller

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200 000 250 500 B,O 1 ı ö ö Ö A1,03 500 500 500 200 750 000 500 500 500 250 500 500 500 500 500 500 500 500 ö ö ö ö ö ö ö ö ö o. Ö Ö ö Ö o. Ö V_2O_5 025 025 010 025 025 500 000 025 025 025 025 025 025 025 025 025 025 025 025 025 ö o. ö ö ö ö o. ö ö ö ö ö ö ö ö ö o. Ö Ö Ge_2O_3 1.000 000 ı 1 1 1 ı 1 1 1 ١ 1 1 1 1 iO_2 500 1.000 000 000 000 000 000 000 000 000 000 000 000 250 000 000 S 8 7. \sim 8 c, $\dot{\sim}$ જં ςi 3 ς; 2 ₽ $\ddot{\circ}$ 2 ö $\dot{\sim}$ $\ddot{\circ}$ ö SrO1.000 500 ı 1 1 1 ı 1 1 1 1 ö CaO1.000 00 1 1 1 1 1 1 ı 1 ١ 1 ١ 1 BaO 000 000 000 000 000 000 000 000 000 000 000 250 000 $\ddot{\circ}$ $\ddot{\circ}$ ci. 7. જાં $^{\circ}$ ç, $\ddot{\circ}$ જં $^{\circ}$ $\ddot{\circ}$ $\ddot{\circ}$ $\ddot{\circ}$ $\dot{\sim}$ 2 8 ٥ż $\ddot{\circ}$ ö $H_{0_2}O_3$ 1 ı ı ı 1 1 625 Y_2O_3 625 625 625 625 625 625 625 625 625 625 625 625 625 625 625 625 1.750 625 ö ö 0 o. o. ö ö ö o. ö o. ö ö ö ö o. ö ö ö MnO+Cr₂O₃ 1.600 900 9 009 900 900 009 1.600 900 900 1.600 1.600 000 000 9 250 9 900 250 900 6. 8 $\ddot{\circ}$ Cr_2O_3 0.600 0.600 900 009 009 009 900 900 900 009 900 900 900 009 025 250 900 900 009 009 ö ö o ö ö ö ö ö ö ö o. o. ö ö o. Ö Ö MnO 1.000 1.000 1.000 1.000 1.000 1.000 000 000 000 000 000 000 400 400 000 1.000 1.000 1.000 1.000 000 ö വ က 4 വ 9 ∞ 2 ~ 24 25 26 23 28 3322 27 29 30 31 32 Comp. Comp. Comp. Comp. Comp. Comp. Сошр. Comp. Ex. Ex.

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Inventor: KOGA ET AL.
Docket No.: 10921.380USWO
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Loss (Ω·F) Strength tan δ Dependence (%) tan δ $(V/μm)$ EIA-X7R IIS - B (%) 3.2 2100 80 O -23 3.4 2450 95 O -24 3.2 2300 90 O -24 3.0 2050 85 O -29 3.8 2350 85 O -29 3.7 2200 85 O -26 3.5 2210 95 O -26 3.4 2650 95 O -24 3.4 2650 95 O -24 3.4 2650 95 O -25 3.4 2650 95 O -24 3.5 2250 85 O -24 3.5 2400 85 O O -24 3.6 2350 90 O -24 3.4	S	Sintering	Dielectric	Dielectric	CR	Dielectric	Tempe	Temperature	DC-Bias	IR
tan δ $(V/\mu m)$ EIA-Y7R JIS-B -23 3256 3.2 2100 80 O -23 3432 3.4 2450 95 O -24 3432 3.4 2450 95 O -24 3210 3.2 2300 90 O -23 3020 3.0 2050 85 O -20 3781 3.8 2350 85 O -29 3800 3.8 2230 95 O -29 3800 3.7 2200 85 O -29 3800 3.7 2200 85 O -29 3800 3.7 2200 85 O -29 3810 3.4 2650 96 O -24 3431 3.4 2650 96 O -24 3420 3.4 250	<u> </u>	ີ ເວ	Constant	Loss	$(\Omega \cdot F)$	Strength	Deper	dence	%	ACCELERATED LIFE
3256 3.2 2100 80 O -23 3432 3.4 2450 95 O -24 3210 3.2 2300 90 O -24 3020 3.0 2050 85 O -20 3781 3.8 2350 85 O -28 3800 3.8 2350 85 O -28 3800 3.8 2310 95 O -28 3800 3.7 2200 85 O -29 3800 3.7 2200 85 O -24 3800 3.4 260 95 O -24 3400 3.4 260 96 O -24 3410 3.4 260 96 O -24 3422 3.5 262 100 O -24 3862 3.7 2250 85 O O -24				tan ô		$(\Lambda/\mu m)$	EIA-X7R	JIS - B		(Hour)
3432 3.4 2450 95 O -24 3210 3.2 2300 90 O -23 3020 3.0 2350 85 O -20 3781 3.8 2350 85 O -28 3800 3.8 2430 95 O -29 3800 3.8 2430 95 O -29 3800 3.7 2210 95 O -29 3640 3.7 2200 85 O -24 3400 3.4 2650 95 O -24 3410 3.4 2650 95 O -24 3421 3.4 2600 90 O -25 3422 3.5 2625 100 O -25 3442 260 96 O -26 -26 3571 3.6 2625 100 O -27 3850 </td <td>13</td> <td>350</td> <td>3256</td> <td></td> <td>2100</td> <td>08</td> <td>0</td> <td>0</td> <td>-23</td> <td>2.3</td>	13	350	3256		2100	08	0	0	-23	2.3
3210 3.2 2300 90 0 -23 3020 3.0 2050 85 0 -20 -20 3781 3.8 2350 85 0 -28 -28 3800 3.8 2430 95 0 -29 -29 3800 3.8 2430 95 0 -29 -29 3650 3.7 2200 85 0 -29 -29 3600 3.7 2200 85 0 -25 -29 3400 3.4 2600 90 0 -24 -24 3431 3.4 2600 90 0 -25 -26 3432 3.5 2655 100 0 -25 -26 3571 3.6 2350 90 0 -26 -26 3350 2.9 2450 85 0 -27 -26 3420 3.4 250 <td< td=""><td>13</td><td>300</td><td>3432</td><td></td><td>2450</td><td>65</td><td>0</td><td>0</td><td>-24</td><td>3.3</td></td<>	13	300	3432		2450	65	0	0	-24	3.3
3020 3.0 0560 85 O -20 -20 3781 3.8 2350 85 O -28 -28 3800 3.8 2430 95 O -29 -28 3800 3.8 2430 95 O -25 -27 3650 3.7 2200 85 O -27 -27 3400 3.5 2500 100 O -24 -24 3400 3.4 2650 96 O -24 -24 3431 3.4 2600 90 O -24 -24 3422 3.5 2625 100 O -24 -24 3422 3.5 2625 100 O -26 -27 3422 3.5 2400 85 O -27 -24 3422 3.4 250 90 O -24 -24 3420 3.4 <t< td=""><td>13</td><td>300</td><td>3210</td><td></td><td>2300</td><td>06</td><td>0</td><td>0</td><td>-23</td><td>2.1</td></t<>	13	300	3210		2300	06	0	0	-23	2.1
3181 3.8 2350 85 O C -28 3800 3.8 2430 95 O -29 -29 3800 3.8 2430 95 O -25 -29 3690 3.5 2210 95 O -25 -27 3690 3.7 2200 85 O -27 -27 3400 3.8 2340 95 O -24 -24 3431 3.4 2650 96 O -24 -24 3422 3.5 2625 100 O -25 -24 3422 3.5 2625 100 O -25 -25 3571 3.6 2350 90 O -27 -27 3350 2.9 2450 85 O -24 -27 3485 3.4 2500 95 O -24 -27 3486 3.4	13	300	3020		2050	85	0	0	-20	2.0
3800 3.8 2430 95 O -29 3525 3.5 2210 95 O -25 3690 3.7 2200 85 O -25 3500 3.7 2200 85 O -27 310 3.5 2500 100 O -24 3400 3.4 2650 96 O -24 3411 3.4 2600 90 O -24 3422 3.5 2625 100 O -25 3422 3.5 2625 100 O -25 3501 3.7 2250 85 O O -25 3502 3.3 2400 85 O O -27 3420 3.4 2500 95 O O -24 3485 3.4 2400 100 O -24 3466 3.4 2400 O O	13	300	3781		2350	85	0	0	-28	2.5
3525 3.5 2210 95 O -25 3690 3.7 2200 85 O -27 3500 3.5 2500 100 O -27 3310 3.4 2650 95 O -24 3431 3.4 2650 95 O -24 3431 3.4 2600 90 O -24 3431 3.4 2600 90 O -25 3422 3.7 2250 85 O -25 3571 3.6 236 O O -25 3571 3.6 236 O O -25 3350 3.3 2400 85 O O -24 3485 3.4 250 96 O -24 -24 3466 3.4 240 O O -24 -24 3486 3.4 2450 O O	13	00	3800	_	2430	95	0	0	-29	3.2
3690 3.7 2200 85 O -27 3500 3.5 2500 100 O -25 3400 3.4 2500 100 O -24 3400 3.4 2650 95 O -24 3422 3.5 2625 100 O -25 3642 3.7 2250 85 O O -25 3571 3.6 2350 90 O -27 -25 3350 3.3 2400 85 O O -24 3420 3.4 2500 95 O O -24 3420 3.4 2400 100 O -24 -24 3485 3.4 2400 100 O -24 -24 3466 3.4 2500 95 O O -24 3486 3.4 2450 O O -24 3486 <td>13</td> <td>300</td> <td>3525</td> <td>_</td> <td>2210</td> <td>95</td> <td>0</td> <td>0</td> <td>-25</td> <td>2.4</td>	13	300	3525	_	2210	95	0	0	-25	2.4
3500 3.5 2500 100 O -25 3310 3.3 2340 95 O -24 3400 3.4 2650 95 O -24 3431 3.4 2600 90 O -25 3422 3.5 2625 100 O -25 3642 3.7 2250 85 O -25 3571 3.6 2350 90 O -27 3350 2.9 2450 85 O O -24 3420 3.4 2500 95 O -24 O 3485 3.4 2400 100 O -24 O 3486 3.4 250 95 O -24 O 3431 3.4 2450 95 O -24 O 3431 3.4 2450 95 O -24 O -24	13	300	3690		2200	85	0	0	-27	2.8
3310 3.3 2340 95 O -24 3400 3.4 2650 95 O -24 3431 3.4 2660 90 O -25 3422 3.5 2625 100 O -25 3642 3.7 2250 85 O -26 -27 3571 3.6 2350 90 O -27 -27 3350 3.3 2400 85 O -24 -24 3420 3.4 2500 95 O -24 -24 3486 3.4 2400 100 O -24 -24 3466 3.4 2450 95 O -24 -24 3431 3.4 2450 95 O -24 -24		000	3500		2500	100	0	0	-25	3.5
3400 3. 4 2650 95 O -24 3431 3. 4 2600 90 O -25 3422 3. 5 2625 100 O -25 3642 3. 7 2250 85 O -25 -25 3571 3. 6 2350 90 O -27 -27 3350 3. 3 2400 85 O O -24 -24 3420 3. 4 2500 95 O O -24 -24 3466 3. 4 2450 95 O O -24 -24 3431 3. 4 2550 95 O O -24 -24 3466 3. 4 2450 95 O O -24 -24 3431 3. 4 2450 95 O O -24 -24	13	350	3310		2340	95	0	0	-24	3.2
3431 3.4 2600 90 0 -25 3422 3.5 2625 100 0 -25 3642 3.7 2250 85 0 -27 -30 3571 3.6 2350 90 0 -27 -27 3350 3.3 2400 85 0 0 -24 -24 3420 3.4 2500 95 0 0 -24 -24 3485 3.4 2400 100 0 -24 -24 3466 3.4 2550 95 0 -24 -24 3431 3.4 2450 95 0 -24 -24		000	3400		2650	95	0	0	-24	3.3
3422 3. 5 2625 100 O -25 -25 3642 3. 7 2250 85 O O -30 3571 3. 6 2350 90 O -27 -27 3350 3. 3 2400 85 O -24 -24 3420 3. 4 2500 95 O -24 -24 3485 3. 4 2400 100 O -24 -24 3466 3. 4 2550 95 O -24 -24 3431 3. 4 2450 95 O -24 -24	13	000	3431		2600	06	0	0	-25	3.2
3642 3.7 2250 85 O -30 -30 3571 3.6 2350 90 O -27 0 3350 3.3 2400 85 O -24 -24 3420 3.4 2500 95 O -24 -24 3485 3.4 2400 100 O -24 -24 3466 3.4 2550 95 O -24 -24 3431 3.4 2550 95 O -24 -24	1	300	3422		2625	100	0	0	-25	3.4
3571 3.6 2350 90 0 -27 3350 3.3 2400 85 0 -24 3020 2.9 2450 80 0 -22 3420 3.4 2500 95 0 -24 3485 3.4 2400 100 0 -24 3466 3.4 2550 95 0 -24 3431 3.4 2450 95 0 -24		350	3642	- 1	2250	85	0	0	-30	3.4
3350 3.3 2400 85 O -24 -24 3020 2.9 2450 80 O -22 -22 3420 3.4 2500 95 O -24 -24 3485 3.4 2400 100 O -24 -24 3466 3.4 2550 95 O -24 -24 3431 3.4 2450 95 O -24 -24		300	3571		2350	06	0	0	-27	3.3
3020 2.9 2450 80 O -22 -22 3420 3.4 2500 95 O -24 -24 3485 3.4 2400 100 O -24 -24 3466 3.4 2550 95 O -24 -24 3431 3.4 2450 95 O -24 -24	17	520	3350		2400	85	0	0	-24	2.4
3420 3.4 2500 95 O -24 -24 3485 3.4 2400 100 O -24 -24 3466 3.4 2550 95 O -24 -24 3431 3.4 2450 95 O -24 -24	17	250	3020		2450	80	0	0	-22	1.5
3485 3.4 2400 100 O -24 -24 3466 3.4 2550 95 O -24 3431 3.4 2450 95 O -24		250	3420		2500	92	0	0	-24	3.4
3466 3.4 2550 95 O O -24 3431 3.4 2450 95 O O -24	12	350	3485		2400	100	0	0	-24	3.0
3431 3.4 2450 95 O -24	12	320	3466		2550	92	0	0	-24	3.2
		250	3431		2450	92	0	0	-24	3.3

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Attorney Name: Douglas P. Mueller
Phone No.: 612.455.3804
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											-											
IR ACCELERATED	LIFE	(Hour)	3.4	2.7	3.2	3.4	3.0	3.1	2.5	1.8	2.8	2.1	2.5	2.0	1.5	ı	2.4	I	0.9	1	1	0.6
DC-Bias	8		-24	-24	-25	-23	-23	-23	-27	-30	-26	-25	-25	-27	-22	1	-28	1	-33	ı	1	-20
Temperature	Dependence	Jrs - B	0	0	0	0,	.O´	0	0	0	O	0	0	0	0	ı	×	I	×	1	ı	×
Tempe	Depei	EIA-A/K	0	0	0	0	0	0	0	0	0	0	0	0	0	ı	×	ı	×	1		0
Dielectric	Strength (V/)	(N/ H III)	95	06	06	85	06	06	06	85	85	65	06	06	02	ı	80	ı	75	I	ı	80
CR	(H·K)		3520	2460	2670	2210	2060	2400	2450	2300	2450	2350	2360	2410	1800	ŧ	2300	ı	1850	ı	1	2550
Dielectric	Loss	0 Lan	3.4	3.3	3.5	3.3	3.2	2.8	3.3	3.7	4.3	3.7	3.5	3.7	3.0	_	3.6	_	4.2	-	_	2.5
Dielectric	Constant		3471	3355	3510	3311	3250	3313	3650	3850	3673	3514	3488	3615	3104	-	3652	_	4050	_	-	2650
Sintering	<u>)</u>		1250	1200	1300	1350	1350	1300	1300	1250	1250	1150	1200	1150	1350	>1350	1350	>1350	1300	>1350	>1350	1250
			Ex. 22	Ex. 23	Ex. 24	Ex. 25	Ex. 26	Ex. 27	Ex. 28	Ex. 29	Ex. 30	Ex. 31	Ex. 32	Ex. 33	Comp. 1	Comp. 2	Comp. 3	Comp. 4	Comp. 5	Comp. 6	Comp. 7	Comp. 8